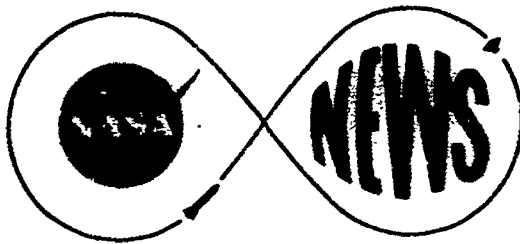


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Washington, D. C. 20546

Phone: 202/755-8370

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Speech by

Dr. James C. Fletcher, Administrator

National Aeronautics and Space Administration

Conference, Survival and Growth:  
Small R & D Firms

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What is taking place here may be a historic step in the development of more technological industry in our country. The combination of efforts of the Small Business Administration and the National Science Foundation may well set a pattern which will carry us into decades of an increased role of government-industry cooperation in the small business area.

We are here because one of the things that we have learned in our research and development effort is that the nation's small R & D business is a valuable resource that has not been fully used. At the peak of the Apollo development effort, some 20,000 firms were involved in the program -- many of them qualifying as small businesses, and participating as sub contractors.

As a result of our experience -- not just in the Apollo program, but in other aspects of space research and development -- I think we have learned a good deal. Both government and the large aerospace corporations particularly, have a better understanding of the small firm, its problems and its often unique capabilities. Now what is needed is to use that understanding to broaden the role of small business in the area of research and development and capitalize on this under-used asset.

To me, the area of greatest opportunity is the area of new technology.

New technology is the area of greatest potential growth in U.S. industry and the key to a favorable international balance of trade. Small business may be the key element which preserves American free enterprise, particularly in new technology. It is an area in which new companies can quickly get started and keep ahead of large business competition by continued innovation and by quick turn-around time in marketing a new item.

A research and development effort as broad and vigorous as that mounted by NASA generates literally hundreds of new processes, new products and new materials. These range from a super paint to fire proof fabrics to a portable operating room for hospitals that is free of bacteria. We want to see these innovations or inventions -- as the case may be -- put to general use in areas not related to space. We have a program called Technology Utilization whose objective is to facilitate such transfers. Each success in this effort means profits for private enterprise, jobs for labor, and benefits for the consumer.

Transfers of this kind should be very attractive for the small entrepreneur. He is flexible where the big company is not, and can take advantage of the financing specifically made available for this kind of enterprise.

Universities have had fair success in transferring their research and development -- mostly their research -- to small companies. Two faculty members of the University of Utah developed a slurry explosive. While still on the faculty, they started a small company to manufacture the product on a part-time basis. When they had their production and marketing problems ironed out -- which took several years -- they left the university, and went into full production. The new company is thriving.

Another company -- the Deseret Pharmaceutical company -- is producing and marketing disposable surgical masks, and doing very well. Where ideas are really new, often a completely new company needs to be formed. While I was at the University of Utah during a seven-year period more than 10 new companies were formed, either directly by faculty or indirectly from the research work done at the university. The classic examples are Xerox and Syntex which started small and became very big indeed.

In examining the successful technology transfers from the University laboratories to the market place, several conditions obtained which, initially, were not part of the government pattern. In all instances mentioned in the foregoing, the founders of the enterprise were able to retain and protect their proprietary interests -- not only patents but proprietary know-how that would give them a working edge over a potential competitor. In addition, the period of pilot operation gave them an opportunity to come to grips with their marketing problem. In instances where they were unable to handle the marketing question, they made a connection with an organization that could.

Up until recently, it was government policy to license an interested producer to manufacture a new product, but if someone else wished to make it he could also get a license to do so. Thus, the first would-be producer had no protection against competition of any kind -- a discouraging prospect. In addition, most applicants had their hands full sorting out production problems and other questions associated with a start up, and neglected the area of marketing.

And, as you know, the problem of marketing can be very difficult indeed. For example, one product of space research that we, at NASA, thought was sure-fire was a paint of unprecedented toughness and durability. But the manufacturer ran into a marketing obstacle of a rare kind. The product was too good! The paint could be safely guaranteed for 25 years, and the public simply refused to believe it. They were suspicious of a gimmick, and wouldn't buy. Moreover, painting contractors weren't interested in using a product with that long a life. It would mean less work for them.

Obviously, this is a very unusual marketing difficulty. But in more ordinary instances we are able to assist the recipient of a license to manufacture in the area of marketing through the small business adviser. And where the problems exceed the adviser's competence, the licensee is strongly urged to seek the advice of a specialist before he gets in too deep. Either contact or merge with the specialist.

On the matter of licensing, we are changing our practice. We now will grant licenses, where circumstances warrant, on an exclusive basis so that the licensee has some patent protection. Further, we will bring to the attention of the prospective producer the importance of the proprietary aspects to the success of his venture.

We are hopeful that exclusive licenses and the new aids proposed by the President will encourage our small business men to move more aggressively into the R & D field. Stepped up activity in this field would significantly strengthen the economy and improve our position in overseas markets.

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I would like to turn now to the matter of government procurement and small business's role in the contracting process. But before doing so, I think, first, it would be useful to dispose of several stereotypes that presently hamper the establishment of a more effective working relationship between government and small business. One is that NASA -- and other federal agencies -- are big-business oriented. Perhaps this impression has been created by the prominence given the letting of contracts for large research and development projects -- such as the design and construction of the Apollo command and service module. In such an instance, it is hard to see how the contract could be handled otherwise. However, we do give special consideration to the small manufacturer on direct contracts -- of which I will have more to say later. And in the case of the multi-million dollar projects, many an alert and aggressive small manufacturer has gotten a piece of the pie in the form of a profitable subcontract.

Secondly, the relationship between NASA, for example, and a contractor is no longer the uncomplicated one of buyer and seller. For example, in examining bids, NASA considers the capability of the contractor to perform according to specifications, and his ability to make delivery on time as well as the level of the bid. Often the relationship is almost a partnership, with both the agency and the contractor working in close association through the entire development stage. NASA has established in-house capabilities of a high order and, on a number of occasions, has made contributions that were vital to the contractor's successful completion of the project.

We view small business as, in many cases, the preferred bidder on a prime contract, or a preferred subcontractor fabricating a component of a large system. But we don't stop there. We regard him as a potential innovator of high technology. And we also look to him as a user and conveyor of innovations that came about, initially, as a result of space work; but which, in adapted form, can be turned to uses unrelated to space.

The position of small business in the area of research and development is strongly reinforced by the President's budget message on science and technology issued last March. In broad terms he called for a "strong new effort" to marshal science and technology in the work of strengthening our economy and improving the quality of life. The message recognizes the importance of technological innovation to productivity, prosperity, foreign markets and jobs. It cites the pivotal role the Federal government plays in shaping American science and technology, and orders a better application of our scientific resources to meeting civilian needs.

Within these guidelines, the Budget message had a special meaning for small business. It called for legislation to encourage the development of small high-technology firms. To compensate for the exceptional risk attendant on ventures of this sort, the President proposed that the SBIC's improve the availability of venture capital to such enterprises. He advocated an increase in the ratio of government support to SBIC's, with the increase channeled to enterprises engaged in the development of inventions or of technological improvements and new products. Other proposals included the lifting of present limits on SBA loans and a small business tax bill designed to provide special incentives for risk-taking and entrepreneurial ventures.

In the context of these proposals, it might be informative to review existing NASA policies and provisions governing small business procurement. While the handling of small business matters varies from agency to agency, NASA's policies are representative enough to serve as an illustration.

Each NASA field facility, and Headquarters as well, has a full time small business specialist who reviews each procurement. He is alert for "set-aside" considerations (the term is self-descriptive), and is supposed to ensure a maximum of small business participation on competitive procurements. He is also responsible for identifying small firms with unique capabilities in areas of NASA's interest. In situations where there are sufficient numbers of capable small business sources to guarantee adequate competition and a fair price, he reserves the procurement exclusively for small business.

NASA solicitations and awards are announced in the Commerce Business Daily. Major procurements which offer attractive subcontracting opportunities are highlighted.

More specifically, NASA has maintained a class set-aside for small business for all construction work between \$2,500 and \$500,000. In 1971, this resulted in 73% of NASA's expenditures for construction going to small business. In addition, each NASA Center has established specific classes of set-asides for small business.



NASA also presses its prime contractors to subcontract to small business wherever practical. A stipulation to this effect is included in all NASA contracts in excess of \$500,000. In Fiscal Year 1971, 82 major NASA prime contractors, participants in this program, subcontracted to small business 25% of all their subcontract awards -- a total of \$116 million.

In the effort to involve small business in space work, it has not been practical for NASA to set a dollar goal. The nature of the Agency's activities, its mission and budget, involve too much flux and change. The goal that we have set is to get more NASA contract dollars placed with small business this year than we did last.

In Fiscal Year 1970, 5.8% of NASA's total dollars went to small business. The percentage for the next fiscal year was 6.6 -- a 10% increase, achieved during a period when total NASA dollar awards declined by 17%. And the biggest percentage in the increase was recorded in research and development procurements: a statistic of more significance for our purposes here than the overall improvement.

The role of the Centers in the effort has been impressive. Langley Research Center and <sup>some AS 604-2</sup> Langley Air Force Base placed \$30 million in contract dollars with small business last year. More than \$7 million of this was set-asides for minority small business. And Kennedy Space Center had more than \$9 million in small business procurements in the first four months of calendar 1972.

My purpose in supplying these statistics is not to try to impress you with what NASA has done to bring small business into space research and development. It is quite possible that other agencies that work with the Small Business Administration can demonstrate a better record. I am simply trying to show you the kind of a small business program that NASA has -- in enough detail so that you can use it to your own advantage. The Federal government and the executive agencies can and have set their regulations so that some of the disadvantages inherent in small business, trying to break in to the research and development field, will be offset. But these will be of small effect unless some initiatives are coming from small business itself. It's a two way street. And it seems to us in government that the provisions of the new budget message along with the special considerations already granted small business, offer a rare opportunity which small business has yet to exploit. Last year, for example, in our solicitation of small business, we received a response on only 53% of the dollars offered -- 9 percentage points less than the previous year, and the lowest response level since 1963.

I suppose there are as many reasons for the failure of a small manufacturer to respond to a solicitation as there are for his lack of success in bidding for a contract. One of them -- lack of knowledge of the regulations which give him a special advantage -- can be overcome with a minimum of effort. The small entrepreneur will find that it pays to familiarize himself with the procurement policies of the federal and state agencies that are engaged in research and development. It will also profit him to establish a liaison with the small business adviser so that he will be advised of procurements in which he might participate.

At the risk of belaboring the obvious, the agencies of the government active in the field of research and development look on the country's small business as a major national asset. We want to do business with you, to work with you, because we think there is a mutual benefit to be gained. And we think future development of the country's economy will depend in large part on this relationship.

We have established a set of ground rules that we think should make doing R & D business with the government attractive, and profitable.

What more needs to be said? We are ready to do our part. We are trying to do our part -- we expect you will do yours.